LISTING OF THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in this application. Added text is indicated by underlining, and deleted text is indicated by ~~strikethrough~~. Changes are identified by a vertical bar in the margin.

1. (Currently amended) A compact holographic data storage system, comprising:

a volume holographic recording medium (10) for storing superimposed interference patterns;

a laser beam emitting assembly (20) having a large output area for emission of parallel laser beams with proper wavelength and cross sectional shape;

a ~~beam splitter (50)~~mirror being disposed in the optical path of parallel beams for separating out a first portion of the parallel beams;

a beam steering system (60) for steeling the partially separated beam as reference beam, such that the reference beam can be directed into the volume holographic recording medium (10) with a proper incident position and angle and cross sectional phase distribution; and

a spatial light modulator (40) ~~composing of~~comprising light gating components disposed in the optical path of a second portion of the parallel beams for holographic data input;

a photo detectors (70) as two dimensional grating format for detecting regenerated signal after the reference beam is directed to the volume holographic recording medium (10), during data read from the holographic medium (10).

2. (Original) The compact holographic data storage system as claimed in claim 1, wherein the laser beam emitting assembly (20) generates laser beams to pass through a cylindrical collimated lens and a rectangular aperture to become parallel beams with proper cross sectional shape.

3. (Currently amended) The compact holographic data storage system as claimed in claim ~~1~~2, wherein the laser beam emitting assembly (20) is disposed in the center of focus area of the cylindrical collimated lens and is composed of a group of laser diodes with different wavelength, and a servo mechanism for fixing laser diode with selected wavelength.

4. (Currently amended) The compact holographic data storage system as claimed in claim 2, wherein the laser beam emitting assembly (20) is disposed in the center of focus area of the cylindrical collimated lens and is composed of a single laser diode that can be adjusted to different wavelength.

5. (Currently amended) The compact holographic data storage system as claimed in claim 1, wherein the ~~beam splitter (50)~~mirror disposed in the optical path of parallel beams ~~is composed of a reflective mirror for separating~~separates out a portion of the parallel beams in slices as reference beam to be directed to the beam steering system (60).

6. (Currently amended) The compact holographic data storage system as claimed in claim 1, wherein the ~~beam splitter (50)~~mirror disposed in the optical path of parallel beams ~~is composed of~~comprises a narrow rectangular aperture for separating out a portion of the parallel beams in slices as reference beam to be directed to the beam steering system (150).

7. (Original) The compact holographic data storage system as claimed in claim 1, wherein the beam steering system (60) is formed by a number of reflective mirrors and a servo mechanism used for controlling the reflective angle of the mirror and the mirror position to direct the reference beam into the volume holographic recording medium (10).

8. (Currently amended) The compact holographic data storage system as claimed in claim 1, wherein the beam steering system (60) is an opto-electronic steering device using the built-in opto-electronic mechanism to control the incident position and angle of the reference beam into the volume holographic recording medium (10).

9. (Original) The compact holographic data storage system as claimed in claim 1, wherein the beam steering system (60) further includes a phase modulator in the optical path of laser beam to modulate a reference beam with proper cross sectional phase distribution.

10. (Original) The compact holographic data storage system as claimed in claim 9, wherein the phase modulator (61) can be implemented by a fully transmissive LCD panel, such that beams can pass through different positions of the LCD panel demonstrating different phase delay characteristics.

11. (Currently amended) The compact holographic data storage system as claimed in claim 1, wherein the spatial light modulator (40) can be implemented with a two dimensional transmissive LCD panel for controlling ON/OFF of the light gating components as parallel beams pass ~~there~~through the two dimensional transmissive LCD panel serving as input apparatus to the holographic recording medium.

12. (Currently amended) The compact holographic data storage system as claimed in claim 1, wherein -the spatial light modulator (40) can be implemented with a two dimensional reflective LCD panel for controlling reflection or no reflection on the light gating components as the parallel beams ~~pass therethrough~~ reflect off the two dimensional reflective LCD panel serving as an input apparatus to the holographic recording medium.

13. (Currently amended) The compact holographic data storage system as claimed in claim 1, wherein the photo detector (70) can be implemented with a charge couple detector (CCD) camera for detecting the reconstructed beam as the

reference beam enters the volume holographic recording medium (10) ~~acting~~ and acts as a data readout apparatus for the holographic medium.

14. (Original) The compact holographic data storage system as claimed in claim 1, wherein the volume holographic recording medium (10) is formed by diffractive crystals made from LiNbO3:Fe or BaTi03.

15. (Original) The compact holographic data storage system as claimed in claim 1, wherein the volume holographic recording medium (10) is formed by organic photo-sensitive material.

16. (New) A compact holographic data storage system comprising:

a volume holographic recording medium for storing superimposed interference patterns;

a laser beam emitting assembly having a large output area for emission of parallel laser beams with proper wavelength and cross sectional shape;

a beam splitter that intercepts a portion of the parallel beams and redirects the intercepted portion;

a beam steering system for steering the intercepted portion of the parallel beams as a reference beam, such that the reference beam can be directed into the volume holographic recording medium with a proper incident position and angle and cross sectional phase distribution;

a spatial light modulator comprising light gating components disposed in the optical path to receive a remaining portion of the parallel beams for holographic data input, wherein none of the remaining portion was incident upon the beam splitter; and

photo detectors in a two dimensional grating format for detecting regenerated signals after the reference beam is directed to the volume holographic recording medium reconstructing a stored holographic data input.